



Chemical and Biological Defense

**CBIAC**  
Information Analysis Center

**Newsletter**

Spring 2003

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A U.S. Department of Defense Information Analysis Center sponsored by the Defense Information Systems Agency, **Defense Technical Information Center**

# Enzyme Research Shows Promise for Nerve Agent Pretreatment, Decontamination and Detection

**N**ew and improved methods for tackling old problems are always welcome. Especially when the new methods bring an added level of protection and safety to populations that may be exposed to Weapons of Mass Destruction (WMD). Current enzyme research at the U.S. Army Medical Research and Materiel Command (MRMC) may provide new options for nerve agent pretreatment, decontamination, and detection.

## Pretreatment

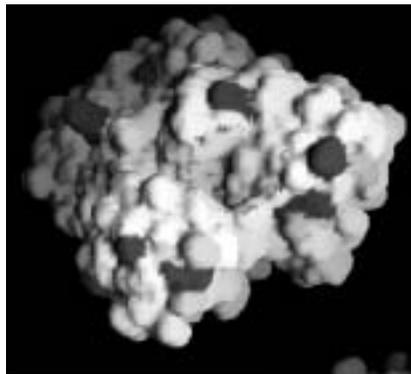
Army researchers are moving closer to perfecting a way to protect soldiers from nerve agents. An enzyme found in the body, butyrylcholinesterase, appears to be an effective pretreatment for nerve agent exposure.

Col. Michelle Ross, director of the Medical Chemical Defense Research Program for the U.S. Army MRMC, explained that humans have butyrylcholinesterase in their bodies that naturally detoxifies a variety of toxins. "When it's administered in an appropriate dose, it protects people from nerve agent exposure for up to two weeks. If a person is exposed to a nerve agent poison, they're not affected," said Ross.

Nerve agents, called organophosphates, work by attacking a class of enzymes in the body, called cholinesterases. When there's not enough of the enzyme acetylcholinesterase, too much of the neurotransmitter acetylcholine builds up and overwhelms receptors in the body. The human serum butyrylcholinesterase, however, binds to the organophosphate and eliminates it before it reaches its target: brain acetylcholinesterase.

"In studies, it protected animals from lethal doses of all the nerve agents and stimulants that were tested: VX, sarin, MEP, tabun," Ross said. When study animals were given doses of the enzyme, there were no side effects; thus, researchers at the Walter Reed Army Institute of Research and the U.S. Army Medical Research Institute of Chemical Defense (MRICD) are confident there's no harm in humans having higher than normal levels of the enzyme in their bloodstreams.

"We've given very high levels of this enzyme to animals and



butyrylcholinesterase



acetylcholinesterase

Photos courtesy of Dr. Richard Gordon, WRAIR

there's been no side effects. None," she said. Researchers at Walter Reed Army Institute of Research (WRAIR) also looked at the animals' antibody responses to see if repeated doses caused the body to try to get rid of the excess. Again, no reaction. "With the warfighter we're very concerned about performance," Ross said. "We don't want to give someone a treatment that is going to have them down and out for hours or days. We want them to be

able to take it in stride and keep going. The banker can take a day [off] and go home and put his feet up. The warfighter can't."

Efforts are underway to obtain and purify large amounts of the enzyme. WRAIR researchers found they could harvest

many of the components they needed using outdated human plasma. They have also started looking at ways to produce affordable, genetically engineered butyrylcholinesterase in greater amounts than by using outdated human plasma. "It's pretty exciting research," Ross said. "We're just waiting for the okay to go into human clinical trials."

## Decontamination

Another item in the research stage at WRAIR that uses similar principles is a decontaminating sponge. Impregnated with enzymes that bind organophosphates and destroy them before they can harm, the sponge, researchers hope, will replace the M291 kit. The kit works by having soldiers rub a black resin over themselves to absorb chemical warfare agents.

While looking for a better solution, researchers at WRAIR set stringent standards for the new product. "We decided that if they were going to replace what's currently used, it can't be any bigger than what the troops already carry, and it has to work in less than five minutes," said Dr. Richard Gordon, a researcher studying new tools for decontaminating people and equipment



The **Chemical and Biological Defense Information Analysis Center (CBIAC)** is a Department of Defense (DoD)-sponsored Information Analysis Center (IAC) operated by Battelle Memorial Institute and administered by the Defense Information Systems Agency (DISA), Defense Technical Information Center (DTIC) under the DoD IAC Program Office (Contract No. SPO700-00-D-3180). The CBIAC is supported by Horne Engineering Services, Inc., Innovative Emergency Management, Inc., MTS Technologies, Inc., QuickSilver Analytics, Inc., and SciTech, Inc. Contact the CBIAC Contracting Officer's Technical Representative (COTR) at:

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U.S. Government agencies and private industry under contract to the U.S. Government can contact the CBIAC for information products and services. CBIAC services also extend to all state and local governments and the first responder community, to include local emergency planners, firefighters, medics and law enforcement personnel.



## TABLE OF CONTENTS

Spring 2003

Volume 4 Number 2

Feature Story: <b>Enzyme Research Shows Promise for Nerve Agent Pretreatment, Decontamination &amp; Detection</b>	1
<b>TAT Focus on CBR Building Protection</b>	3
<b>Contract Awards</b>	4
<b>New CBIAC Information Resources</b>	5
<b>Calendar of Events</b>	6
<b>In the News</b>	7
<b>Army Grants Commercial License for Topical Skin Protectant Technology</b>	8
<b>DefenseLINK Resources</b>	10
<b>New CBIAC Products</b>	12

The *CBIAC Newsletter*, a quarterly publication of the CBIAC, is a public release, unlimited distribution forum for chemical and biological defense information. It is distributed in hardcopy format and posted in Portable Document Format (PDF) on the CBIAC Homepage.

The CBIAC welcomes unsolicited articles on topics that fall within its mission scope. All articles submitted for publication consideration must be cleared for public release prior to submission. The CBIAC reserves the right to reject or edit submissions. For each issue, articles must be received by the following dates: Winter (First Quarter) - November 1st; Spring (Second Quarter) - February 1st; Summer (Third Quarter) - May 1st; Fall (Fourth Quarter) - August 1st.

All paid advertisements and articles are subject to the review and approval of the CBIAC COTR prior to publication. The appearance of an advertisement or article in the *CBIAC Newsletter* does not constitute endorsement by the DoD or the CBIAC.

The CBIAC is located in building E3330, Room 150, Aberdeen Proving Ground-Edgewood Area, Maryland 21010. For further information or assistance, visit or contact the CBIAC.

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# TAT Focus on CBR BUILDING PROTECTION



The CBIAC has responded to the growing concern of a domestic chemical, biological or radiological (CBR) terrorist incident by leveraging years of experience working with military CBR defense technologies and equipment to provide effective means for protecting critical infrastructure assets and personnel. Through its Technical Area Task (TAT) program, the CBIAC has provided CBR Protection Services to programs such as the U.S. Chemical Stockpile Emergency Preparedness Program (CSEPP), the Pentagon Force Protection Agency (PFPA) Golden Guardian Program, and the Defense Threat Reduction Agency (DTRA) Smart Building Program. The CBIAC provides cradle-to-grave services to ensure CBR building protection solutions are effectively designed and implemented.

into workable frames of reference for the **Vulnerability Assessment**, which includes the review and analysis of building/asset layout and structure, intended and actual operational uses, equipment, personnel, procedures, training and environment. Identified vulnerabilities are prioritized based upon the probability of the threat, their impact and the capability to respond/protect against the threat.

The completed threat and vulnerability assessments are then used to develop potential technical solutions as part of the **Protection Assessment**, which often includes site assessment, drawing reviews, user interviews, field-testing, technology reviews and building/contaminant transport modeling.

## Process

CBIAC TATs for CBR Building Protection Services may include initial threat, vulnerability, and protection assessments; the conceptual and system design; execution of the fabrication/assembly, installation and system check-out; development of a training program; and the assessment of Operating and Maintenance (O&M) services for the implemented solutions.

## Assessments

The objective of the threat and vulnerability assessment process is to define the problem. **CBR Threat Assessments** focus on the characteristics (e.g., the means of delivery, threat agent type and quantity, release location), the potential targets, and probability of occurrence for airborne (internal and external), foodborne, waterborne, and mail/package delivery threat scenarios.

Threat characteristics are translated



The **Site Assessment** includes site visits and a detailed review of building drawings to help determine the location, feasibility, and potential effectiveness of protection equipment.

**User Interviews** are conducted with relevant personnel to determine the requirements of the building users (e.g., operational, physical, regulatory, fiscal), the level of protection required, the feasibility of implementing protective solutions and the feasibility of installing protective equipment.

**Field Testing** determines the size, location, feasibility, and potential effectiveness of protection equipment.

## Protective Solutions

Protective solutions range from simplistic, low cost to complex, high cost and may include evacuation plans, sheltering-in-place (SIP), enhanced SIP, expedient protection devices, ambient pressure collective protection (CP) equipment, and integrated positive pressure CP. Solutions may also incorporate various CBR detection sensors, integration with active building/mechanical/HVAC controls

# Contract Awards • *by Mary Frances Tracy*

## **Establishment and Operation of the Survivability and Vulnerability Information Analysis Center (SURVIAC)**

Booz-Allen and Hamilton • McLean, VA  
\$56,590,302. January 9, 2003  
By DSCC,  
Columbus, Ohio

## **Supersensitive Detection of Scrub Typhus**

BioTraces Inc. • Herndon, VA  
\$69,816. January 10, 2003  
By U.S. Army Medical Research Acquisition Center,  
Ft. Detrick, MD

## **Yeast-Based Biosensor for Organophosphate Detection - Exercise of Option**

Luna Innovations, Inc. • Blacksburg, VA  
\$49,990. January 17, 2003  
By U.S. Army Medical Research Acquisition Center,  
Ft. Detrick, MD

## **Chemical Detection Kits**

Trutech Inc. • Riverhead, NY  
\$156,094. January 21, 2003  
By U.S. Army Tank-Automotive & Armaments Command,  
Rock Island, IL

## **M8 Paper and M9 Paper**

Trutech Inc. • Riverhead, NY  
\$502,254. January 23, 2003  
By U.S. Army Tank-Automotive & Armaments Command,  
Rock Island, IL

## **M256A1 Detector Kits**

Canadian Commercial Corporation • Ontario, Canada  
\$974,466. January 27, 2003  
By U.S. Army Tank-Automotive & Armaments Command,  
Rock Island, IL

## **M295 Decontamination Kits**

Trutech Inc. • Riverhead, NY  
\$6,403,584. January 29, 2003  
By U.S. Army Tank-Automotive & Armaments Command,  
Rock Island, IL

## **XE555 Decon Powder**

Trutech Inc. • Riverhead, NY  
\$1,400,000. January 31, 2003  
By U.S. Army Tank-Automotive & Armaments Command,  
Rock Island, IL

## **Protective Entrances**

Production Products • St. Louis, MO  
\$422,865. January 31, 2003  
By U.S. Army Tank-Automotive & Armaments Command,  
Rock Island, IL

## **Maintenance and Supply Support for the NBCRS Vehicles**

General Dynamics Land Systems, Inc. • Sterling Heights, MI  
\$1,268,947. January 31, 2003  
By U.S. Army Tank-Automotive & Armaments Command,  
Rock Island, IL

## **M23A1 Gas Particulate Filters and M24 Particulate Filters**

Hunter Manufacturing Company • Solon, OH  
\$259,425. January 31, 2003  
By U.S. Army Tank-Automotive & Armaments Command,  
Rock Island, IL

## **Chem/Bio Ladar Detection, Identification and Transport Analysis Simulator**

Coherent Technologies Inc. • Louisville, CO  
\$1,275,000. February 4, 2003  
By U.S. Air Force Research Laboratory,  
Eglin Air Force Base, OH

## **M40A1 Field Masks and M42A2 Vehicle Masks**

ILC Manufacturing Products Division • Frederica, DE  
Sole Source. February 14, 2003  
By U.S. Army Tank-Automotive & Armaments Command,  
Rock Island, IL

## **Decontaminating Agent**

Modec Inc. • Denver, CO  
\$137,500. February 18, 2003  
By Defense General Supply Center,  
Richmond, VA

## **Refurbishment of Chemical Agent Monitors**

General Dynamics Armament & Technical Products •  
Deland, FL  
\$5,685,624 (Part of \$12,000,000 contract). March 21, 2003  
By U.S. Army Tank-Automotive & Armaments Command,  
Rock Island, IL

## **Development of Countermeasures to Biowarfare Agents**

Genesoft Inc. • South San Francisco, CA  
\$5,500,465. April 8, 2003  
By U.S. Army Robert Morris Acquisition Center,  
Research Triangle Park, NC

## **Biological Effects of Non-Lethal Technologies Electromagnetic Radiation**

Battelle Memorial Institute • Richland, WA  
\$687,918. April 8, 2003  
By Office of Naval Research, Arlington, VA

## **Development of Countermeasures to Biowarfare Agents**

Genesoft Inc. • South San Francisco, CA  
\$5,500,465. April 8, 2003  
By U.S. Army Robert Morris Acquisition Center, Research  
Triangle Park, NC

# New CBIAC Information Resources • By Richard M. Gilman

## Books

Committee on Science and Technology for Countering Terrorism. National Research Council. **Making the Nation Safer: The Role of Science and Technology in Countering Terrorism** Washington, D.C.: National Academy Press, 2002.

This study, compiled by the National Academies, was prepared as part of a response to the terrorist attacks of September 11, 2001. It identifies and examines fourteen areas of societal vulnerability. These include human and agricultural health systems, toxic chemicals and explosive materials, energy systems, transportation systems, cities and fixed infrastructure, the response of people to terrorism, and the problems associated with equipping the Federal Government to counter terrorism.



Includes appendices describing the background of the committee members and an index.

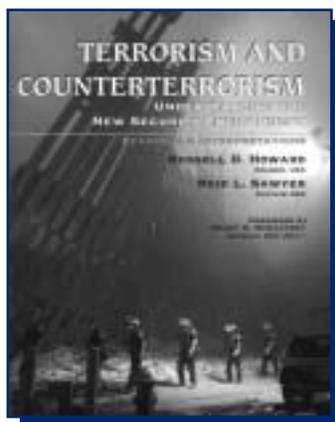
Full text can be reviewed online at the website of the National Academy Press reading room located at <http://www.nap.edu>.

CB-189088 • ISBN 0-309-08481-4  
National Academy Press  
Box 285 • 2101 Constitution Ave., N.W.  
Washington, D.C. 20055  
Phone: 1-800-624-6242 or 202-334-3313  
<http://www.nap.edu>

Howard, Russell D. and Reid L. Sawyer. **Terrorism and Counterterrorism--Understanding the New Security Environment--Readings and Interpretations**. Guilford, CT: McGraw-Hill/Dushkin, 2002.

This work provides the perspectives of approximately three dozen recognized authorities that have explored the full gamut of terrorism/counterterrorism issues that face the United States and the international community today.

Of particular relevance to CB defense are chapter-length



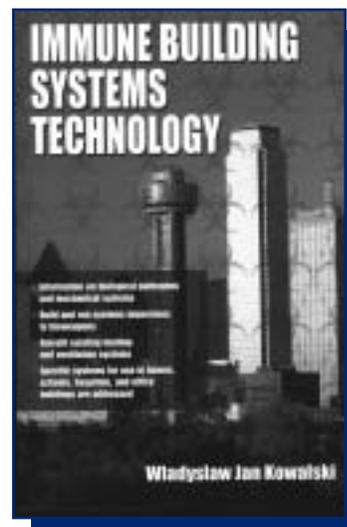
discussions on "Getting and Using the (WMD) Weapons," "Toward Biological Security," "The Chemical Weapons Threat," "Covert Biological Weapons Attacks Against Agricultural Targets," and "NBC-Armed Rogues: Is There a Moral Case for Preemption?"

Includes five appendices.

CB-189089 • ISBN 0-07-283778-0  
McGraw-Hill--Professional Books  
Two Penn Plaza • 5th Floor • New York, N.Y. 10121  
Phone: 1-888-878-5150  
<http://www.mcgraw-hill.com>

Kowalski, Wladyslaw Jan. **Immune Building Systems Technology**. New York: McGraw-Hill Companies, Inc., 2003.

This book deals with the designing, retrofitting, and building of integrated air ventilation, air treatment, and detection and control systems for the protection of building occupants against biological and chemical agents. There are chapter length-treatments of such topics as the dose and epidemiology of CBW agents, dispersion and delivery systems, buildings and attack scenarios, air-cleaning and disinfection systems, immune building control systems, decontamination and remediation, mailrooms and CBW agents.



Also of relevance to CB-defense are the six appendices: "Database of Biological Weapon Agents," "Database of Pathogen Disease and Lethal Dose Curves," "Database of Toxins and Dose Curves," "Database of Chemical Weapon Agents," "UVGI System Sizes and Kill Rates," and "Source Code for Direct UVGI Field Average Intensity."

Includes a glossary of technical terms and an index.

CB-160931 • ISBN 0-07-140246-2  
McGraw-Hill--Professional Books  
Two Penn Plaza • 5th Floor • New York, N.Y. 10121  
Phone: 1-888-878-5150  
<http://www.mcgraw-hill.com>

## CALENDAR OF EVENTS

If you would like to have a Chemical and/or Biological Defense or Homeland Security course or event posted on the CBIAC Calendar of Events, submit the pertinent information via email to [cbiac@battelle.org](mailto:cbiac@battelle.org). Due to space limitations, the CBIAC will accept submissions on a first-come, first-served basis and reserves the right to reject submissions. For a more extensive list of events, visit our website at <http://www.cbic.apgea.army.mil/>.

June 15-18, 2003

### **Symposium on Nuclear, Biological and Chemical Threats – A Crisis Management Challenge**

Jyväskylä Paviljonki  
Jyväskylä, FINLAND

<http://www.vtt.fi/aut/rm/spt/index1.htm>

June 15-19, 2003

### **Beyond Genome, Solutions for the Post Genomic Era**

San Diego, CA

[www.beyondgenome.com](http://www.beyondgenome.com)

June 15-19, 2003

### **Principles & Practices of Biosafety**

Richmond, CA

<http://www.absa.org/conactivities.html>

June 15-20, 2003

### **Surgeon General's 2003 US Public Health Service Professional Conference**

Weaving Tomorrow's Public Health Infrastructure  
Scottsdale, AZ

<http://conference.coausphs.org/>

June 16-19, 2003

### **Security Symposium and Exhibition: Opportunities for Innovation & New Technologies "**

Reston, VA

<http://register.ndia.org/interview/register.ndia?~brochure~3490>

June 17, 2003

### **Homeland Defense Training Conference – Forecast and Budget Outlook and Grants Workshop**

Los Angeles, CA

[http://www.marketaccess.org/event\\_hd\\_outlook\\_la.asp](http://www.marketaccess.org/event_hd_outlook_la.asp)

June 17-18, 2003

### **Federal Information Superiority Conference**

Colorado Springs, CO

<http://www.fbcinc.com/fisc>

June 17-18, 2003

### **Information Operations Conference**

Ft. Meade, MD

<http://www.crows.org/eventsConferences.htm>

June 22-25, 2003

### **13 th World Conference on Disaster Management: New Threats, New Approaches**

Toronto, Canada

<http://www.wcdm.org/>

June 22-25, 2003

### **BIO 2003 Annual Convention**

Washington, DC

<http://www.bio.org/events/2003/>

June 22-26, 2003

### **96 th Annual Conference & Exhibition: "Environment in Balance"**

San Diego, CA

<http://www.awma.org/ACE2003/default.asp>

June 22-27, 2003

### **Toxicogenomics**

Bates College

Lewiston, ME

<http://www.grc.uri.edu/programs/2003/toxico.htm>

June 23-25, 2003

### **Armaments for Full Spectrum Warfare**

Parsippany, NJ

<http://register.ndia.org/interview/register.ndia?~Brochure~3600>

June 23-27, 2003

### **Special Forces Expo**

Fort Bragg, NC

[http://register.ndia.org/interview/register.ndia?PID=Brochure&SID=\\_0VG0WX6VS&MID=3890](http://register.ndia.org/interview/register.ndia?PID=Brochure&SID=_0VG0WX6VS&MID=3890)

June 23-27, 2003

### **49 th Annual Tri-Service Radar Symposium**

Boulder, CO

<http://www.iriacenter.org>

June 30-July 2, 2003

### **Government Symposium on Information Sharing & Homeland Security**

Philadelphia, PA

<http://www.federalevents.com>

June 2003

### **Lecture Series 239 on Chemical and Biological Defense**

Location to be Determined

POC: Research & Technology Organisation

<http://www.rta.nato.int/Meetings.asp>

July 9-10, 2003

### **Department of Homeland Security IT Security Conference & Workshop**

Baltimore, MD

[www.fbcinc.com](http://www.fbcinc.com)

## IN THE NEWS

By Mary Frances Tracy

### Closing the Gaps: New paste acts as chemical weapons barrier where warfighters' mission-oriented protective posture gear closes

Karen Fleming-Michael

**Ft. Detrick Standard**

January 9, 2003

"When an M8A1 alarm sounds, telling soldiers a nerve agent is in the air, seconds become a precious commodity..."

"In fact, studies show there's a fairly high rate of incorrectly putting on mission-oriented protective posture, or MOPP, gear so soldiers may expose themselves to possible leaks, said Dr. Ronald Clawson, Deputy Project Manager, Chemical Biological Medical Systems Project Management Office..."

"This vulnerability was one of the reasons that scientists at the U.S. Army Medical Research Institute of Chemical Defense invented SERPACWA to act as a barrier against chemical weapons. Although resembling vegetable shortening in appearance and texture, the Army-patented Skin Exposure Reduction Paste Against Chemical Warfare Agents quickly forms a non-tacky film on the skin after it's applied where gaps in MOPP gear can occur."

[http://www.dcmilitary.com/army/standard/8\\_01/features/20978-1.html](http://www.dcmilitary.com/army/standard/8_01/features/20978-1.html)

### Rapid 'dipstick' plague test developed

**Associated Press**

January 17, 2003

"Scientists have developed a simple and reliable test to rapidly diagnose plague, a sometimes deadly disease that authorities fear could be used in a bioterror attack..."

Experts say the new test could save lives and help control the disease in the developing world."

<http://www.cnn.com/2003/HEALTH/conditions/01/17/plague.test.ap/index.html>

### 20/20 Launches Innovative Bio-Terrorism Field Test for 1st Responders

**20/20 GeneSystems, Inc. Press Release** February 10, 2003

"GeneSystems, Inc. (20/20), a biotechnology company, today announced the launch of a new product to help first responders screen suspicious powders for bioterrorism agents. The *BioCheck*™ Powder Screening Kit works by quickly identifying the presence or absence of protein, a biomolecule found in all living materials. It therefore provides a rapid screen for the possible presence of multiple bioterrorism agents such as anthrax and ricin toxin, while ruling out most of the ordinary substances that citizens have frequently feared to be possible weapons of mass destruction (WMDs)."

[www.2020gene.com](http://www.2020gene.com)

### Pentagon to Issue Escape Masks to Employees

Jim Garamone

**DefenseLink News**

February 20, 2003

"Every person on the Pentagon reservation will receive 'escape masks' in the event the building is attacked again, DoD officials said today..."

"Between 23,000 and 24,000 people work on the Pentagon

reservation. Because it is the nation's military command center in addition to being an office building, it is manned 24 hours a day, seven days a week. Washington Headquarters Services has bought 80,000 escape masks. Force protection employees will train people on how to wear the masks and start issuing them to employees by the end of February."

[http://www.defenselink.mil/news/Feb2003/n02202003\\_200302202.html](http://www.defenselink.mil/news/Feb2003/n02202003_200302202.html)

### A New Base for Developing Chemical, Biological Defenses

Steve Vogel

**Washington Post**

February 27, 2003

"The Battelle Eastern Region Technology Center, a \$20 million, 78,000-square-foot facility with 16 chemical and biological laboratories and 200 employees, has been completed and is set to open with a ribbon-cutting next month..."

"Among other work, the new lab at Aberdeen will research ways to improve the detection of chemical and biological weapons..."

<http://www.washingtonpost.com/ac2/wp-dyn?pagename=article&node=&contentId=A4718-2003Feb26&notFound=true>

### DNA Methods Speed Up Detection of Bioterror Agents

Patricia Reaney

**Reuters**

March 10, 2003

"Scientists in Northern Ireland have developed DNA fingerprinting techniques that can speed up the detection of organisms in food and water supplies that could kill thousands of people in a bioterrorist attack."

Instead of taking days to trace pathogens such as E.coli or the organism *Cryptosporidium*, the techniques devised by Dr. Colm Lowery and researchers at the University of Ulster in Northern Ireland, can pinpoint the type and the source of the deadly agent in 15 minutes."

[http://www.abcnews.go.com/wire/US/reuters20030310\\_266.html](http://www.abcnews.go.com/wire/US/reuters20030310_266.html)

### New weapon against germ warfare

Tom Heap

**BBC News**

March 6, 2003

"...A novel technology is being developed which has created a liquid repellent coating which prevents toxic agents penetrating soldiers' uniforms."

It could also have wider uses in civilian life such as creating glasses that do not fog, clothes that do not become waterlogged or soldiers who are better equipped for modern warfare...The secret to the development is cold plasma.

Gases in a chamber are energised by electricity.

Items such as soldiers' uniforms are put in a tube and come out with an invisible coating of flourine which in turn has extraordinary effects."

[http://news.bbc.co.uk/go/pr/fr/-/2/hi/uk\\_news/2827829.stm](http://news.bbc.co.uk/go/pr/fr/-/2/hi/uk_news/2827829.stm)

### A Better Sensor for Nerve Gas

Ron Dagani

**C & E News**

March 10, 2003

Timothy M. Swager, along with Shi-Wei Zhang, think they have the best detection system so far devised for sniffing out

## Army grants commercial license for topical skin protectant technology

by Cindy Kronman, PAO, USAMRICD

**T**he U.S. Army Medical Research and Materiel Command has granted a license for a patented topical skin protectant technology to DFB Pharmaceuticals Inc. and its affiliates Healthpoint Ltd. and DPT Laboratories. The licensing agreement was signed in September 2002, and provides licensing fees and royalties on commercial sales to the MRMC.

The topical skin protectant was developed at the U.S. Army Medical Research Institute of Chemical Defense, a subordinate laboratory of MRMC, and approved by the U.S. Food and Drug Administration for use by the warfighter as additional protection against exposure to chemical warfare agents when used in conjunction with chemical protective clothing. The military product, available to warfighters in 2003, goes by the nomenclature SERPACWA, or Skin Exposure Reduction Paste Against Chemical Warfare Agents.

The licensing agreement grants DFB Pharmaceuticals the right to develop the protectant cream into commercial products for consumers. According to Paul Duesterhoft, DFB Pharmaceutical's vice president for New Business Development, such products would be developed "to reduce the reoccurrence of contact dermatitis associated with exposure of skin to a variety of irritants, including allergens such as poison ivy, oak, and sumac, as well as solvents and bodily fluids." DFB's Healthpoint affiliate will seek FDA approval for these consumer-based products and will also pursue approval of the current military product for use by first responders and consumers.



Poison Ivy

Dr. Paul Mele, director, Office of Research and Technology Applications, at MRMC, says, "This is a positive business arrangement that takes a product out of the government and into the real world."

## In the News *cont.*

chemical warfare agents such as tabun (GA), sarin (GB), and soman (GD). The new chemosensor detects nerve agents by how they react with an indicator molecule. "...the sensor, in the form of a thin film, responds in seconds to 10 ppm of diisopropylfluorophosphate vapor, which is a less reactive relative of sarin gas."

<http://pubs.acs.org/cen/topstory/8110/8110notw2.html>

### Navy Team On The Prowl for Chem/Bio Agents

Doris Ryan

#### Bureau of Medicine and Surgery Public Affairs

April 10, 2003

"In the desert of northern Kuwait, south of the Iraqi border in a small, unobtrusive mobile field laboratory are three Navy people; a microbiologist and two advanced laboratory technicians. They are screening environmental samples for biological warfare agents, and they may be the first to find evidence that an attack has occurred. 'Our team in Kuwait has very sophisticated detection capabilities, and they will be looking for the molecular signatures of specific biologic agents,' said Capt. Al Mateczun, director of the Biological Defense Research Directorate (BDRD) at the Naval Medical Research Center (NMRC), Silver Spring, Md. 'Once they receive a sample, they will have an initial report in 15 minutes; if positive, they will have confirmation in 35 minutes.' "

<http://www.globalsecurity.org/wmd/library/news/iraq/2003/iraq-030410-nns04.htm>

### FIRST JOINT PROGRAM EXECUTIVE OFFICE FOR CHEMICAL AND BIOLOGICAL DEFENSE FORMED

#### DefenseLINK

April 25, 2003

"The Department of Defense today announced the formation of the first ever Joint Program Executive Office for Chemical and Biological Defense (JPEO-CBD). This DoD initiative will focus on the protection of soldiers, sailors, airmen, and Marines against the use of battlefield chemical and biological weapons. The JPEO will be led by Brig. Gen. Stephen V. Reeves and will be located in the National Capital Region..." "The JPEO-CBD will also be responsible for research, development, acquisition, fielding, and life-cycle support of chemical and biological defense equipment and medical countermeasures supporting the national military strategy."

[http://www.defenselink.mil/news/Apr2003/b04252003\\_bt277-03.html](http://www.defenselink.mil/news/Apr2003/b04252003_bt277-03.html)

The CBIAC Web site maintains links to online news forums that report on CB Defense and Homeland Security issues and events. Visit the CBIAC Web site's *CBD Current Headlines* feature under **CBD Resources!**

[http://www.cbiac.apgea.army.mil/resources/ch\\_choice.html](http://www.cbiac.apgea.army.mil/resources/ch_choice.html)

## New CBIAC Info. Resources *cont.*

### Documents from the Web

Advisory Panel to Assess Domestic Response Capabilities for Terrorism Involving Weapons of Mass Destruction. **Fourth Annual Report to the President and Congress of the United States of the Advisory Panel to Assess Domestic Response Capabilities for Terrorism Involving Weapons of Mass Destruction. IV. Implementing the National Strategy.** Santa Monica, CA: Rand Corporation, 2002.  
<http://www.rand.org/organizations/nsrd/terrpanel/terror4.pdf>

This fourth annual report focuses on the implementation of the national counter-terrorism strategy and makes policy recommendations in five areas. These are organizing the national effort, defending against agricultural terrorism, improving the protection of our critical infrastructure and establishing appropriate roles, and missions for the Department of Defense.

Chapter-length discussions include "Reassessing the Threat," "Improving Health and Medical Capabilities," "Improving the Protection of Our Critical Infrastructure," and "Establishing Appropriate Structures, Roles, and Missions for the Department of Defense."

Includes numerous tables and 20 appendices.

CB-160958 • Rand  
 1700 Main Street • P.O. Box 2138  
 Santa Monica, CA 90407  
 Phone: 310-393-0411 • Fax: 310-393-4818  
<http://www.rand.org>

National Institute of Justice. **Guide for the Selection of Personal Protective Equipment for Emergency Responders. NIJ Guide 102-00.** Vols. I-IIc. Washington, D.C.: U.S. Department of Justice, 2002.

Volume I, Nov 2002 (Overview)  
<http://www.ncjrs.org/pdffiles1/nij/191518.pdf>

Volume IIa, Nov 2002 (Respiratory Protection)  
<http://www.ncjrs.org/pdffiles1/nij/191519.pdf>

Volume IIb, Nov 2002 (Percutaneous Protection--Garments)  
<http://www.ncjrs.org/pdffiles1/nij/191520.pdf>

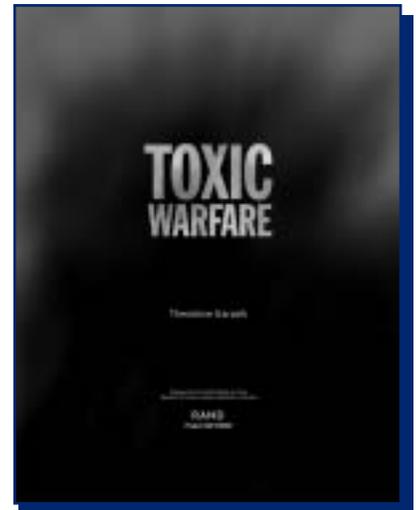
Volume IIc, Nov 2002 (Percutaneous Protection--Apparel)  
<http://www.ncjrs.org/pdffiles1/nij/191521.pdf>

"The primary purpose of the **Guide for the Selection of Personal Protective Equipment for Emergency First Responders** is to provide emergency first responders with information to aid them in the selection of PPE, both respiratory protection and percutaneous (skin) protection. The guide is intended to be more practical than technical and provides information on a variety of factors that should be considered when purchasing or using PPE, including duration of protection, dexterity/mobility (how cumbersome is the equipment), launderability, and use/reuse, to name a few." (Introduction)

CB-160962, CB-160963, CB-160964, CB-160965  
 U.S. Department of Justice • Office of Justice Programs  
 810 Seventh Street, N.W. • Washington, D.C. 20531  
<http://www.ncjrs.org>

Karasik, Theodore. **Toxic Warfare.** Washington, D.C.: Rand Corporation, 2002  
<http://www.rand.org/publications/MR/MR1572/index.html>

"Recent events suggest that 'toxic warfare'—or the use of inexpensive chemicals and industrial waste in weaponry—is on the rise. Accordingly, this report offers an initial analysis of the extent of the problem by bringing together what is currently known about toxic weapon use. Both state and nonstate actors (including insurgents and terrorists) are using toxic weapons, which provide an attractive asymmetrical option because they are inexpensive, are available in large quantities, are found in urban areas, and, perhaps most significantly, are not entirely secure from theft and diversion... This report examines the implications of toxic weapon use for military planning and concludes that such weapons merit further analysis." (Preface)



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<http://www.rand.org>

## “Enzyme Research” cont.

at WRAIR. By including the enzyme acetylcholinesterase in the sponge, "it grabs organophosphates, whether it's the ones we have today, the ones used years ago or ones that may be created in the future," Gordon said. "The additives in the sponge not only remove the organophosphates from the skin but also destroy them."

To make the sponge, two compounds are combined in a double-barreled syringe. With the consistency of a piece of bread, the sponge can be made to the size of a towelette or larger for big clean ups.

"With this product, you can squirt it right on the chemical (agent) and no chemical will come out," said Dr. Bhupendra Doctor of WRAIR. "So not only will it detoxify it, but it will contain it. People can pick it up, and it can't contaminate any longer because anything that's bound to it is permanently enclosed and gradually destroyed."

Researchers at WRAIR are also looking at how to reactivate the sponge once its enzymes are exhausted. By adding chemicals called oximes to the sponge, it can be reused in 10 to 20 minutes, Gordon said.

"If you have a sufficient quantity of oximes, then you can have the cycle of depletion and reactivation go around and around," he said.

### Detection

The sponge may also play the role of a sensor.

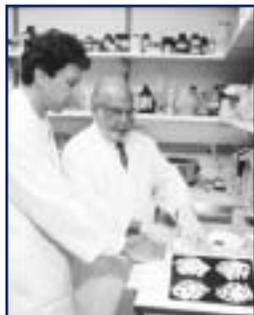
"When there's a reaction, the sponge changes color. That says the enzyme has encountered a nerve agent," Ross said. "So if the color changes, you start decon, look for casualties..."

Unlike current methods that need a costly field-worthy mass spectrometer to determine what chemical warfare agent is present, any soldier will be able to detect agents using the sponges because of the way the sponges' enzymes react to specific organophosphates.

Right now, the sponge is only marginally effective against vesicants, or blister agents, so WRAIR researchers continue improving it. "The warfighter isn't interested in something that just works against nerve agents," Ross said. "They want something that works against everything; a universal decon sponge."

**Note:** This article is adapted with permission from the original article, "Enzymes play key role in future nerve agent protection, decon" by Karen Fleming-Michael, which appeared in the April 3, 2003 issue of the Fort Detrick Standard. The original article can be viewed online at the following websites:

<http://wrair-www.army.mil/news&events/news/enzymes.htm> or  
[http://www.dcmilitary.com/army/standard/8\\_7/health/22420-1.html](http://www.dcmilitary.com/army/standard/8_7/health/22420-1.html)



(Courtesy photo)

Researchers inspect sponges developed at the Walter Reed Army Institute of Research that use enzymes to decontaminate and neutralize nerve agents. The sponges may one day be used as sensors for chemical agents.

For individuals and organizations seeking ways to offer assistance and support to our soldiers and their families, the following resources are available under "DoD Sites" at

**DefenseLINK**  
U.S. DEPARTMENT OF DEFENSE



DefenseLINK

<http://www.defense.gov/>

Dear Abby, Operation

<http://anyservicemember.navy.mil/>

Defend America

<http://www.defendamerica.mil/>

DeploymentLINK

<http://deploymentlink.osd.mil/>

(Select "Support Our Troops" under "What's New".)

Enduring Freedom

<http://www.defense.gov/sites/e.html#oef>

Security forces from the US, Great Britain and Australia work together.  
Photo by: SSGT DAVID DONOVAN U.S. Air Force • <http://www.defense.gov/>

## “TAT Focus on CBR” *cont.*

systems, physical security systems, and the incorporation of decontamination and forensic sampling depending upon the level of protection required.

The incorporation of **Sheltering-in-Place (SIP)** techniques relies upon the use of the passive protection afforded by the building structure. Protection is afforded by decreasing infiltration of external contaminants by closing windows, vents, and doors, and shutting of HVAC systems. SIP is only a temporary protective measure and must include an ultimate evacuation plan to remove personnel from the contaminant threatened area.

**Expedient Collective Protection** approaches operate independently of the building's HVAC system and incorporate the use of expedient fan/filter units to protect areas of a building. This approach provides filtered air and pressurization to the safe area.



Small Area Filtration Equipment (SAFE KIT)



**Ambient Pressure Collective Protection** approaches incorporate the use of low efficiency gas/particulate filters within existing Air Handling Units (AHUs) to continuously remove internally and externally released CB agents. This approach is designed to reduce the dependency on an early warning system to provide continual protection at a low cost.

**Integrated Positive Pressure Collective Protection** uses high efficiency gas/particulate filters integrated with the existing HVAC system to remove CBR agents. This approach prevents the infiltration of external contaminants by positively pressurizing the entire building using clean air. Filters provide a removal efficiency in excess of 99.997%.

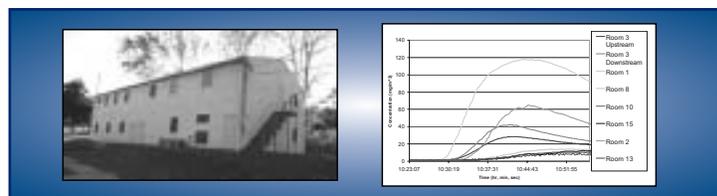
Based on the identified threats to and vulnerabilities of a building/infrastructure asset, protective solutions are presented in the form of a cost-benefit analysis for decision-making purposes.

## System Design

Once a protective solution is selected, experience and expertise with off the shelf (OTS) CBR sensor units performance, the design and fabrication of customized collective protection filtration and system, and selection of decontamination procedures are utilized to bring the customized building protection solution into reality. Fabrication may range from simple mounts for OTS to the complete assembly of complex filtration systems.

## Installation & Testing

Once the protective solution is designed and fabricated it is integrated and installed in accordance with local building codes. The full capability is demonstrated and evaluated.



A 2-story building was used to demonstrate the transport of chemical simulants within the building and the effectiveness of filtration technologies

## Training

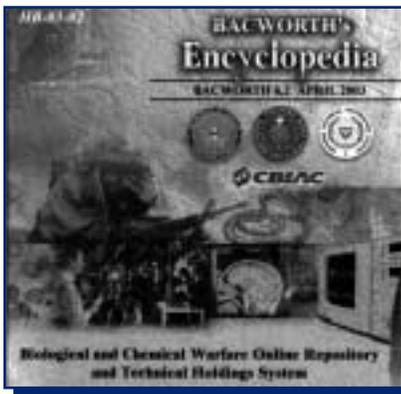
For each protective solution implemented, training support required to instruct operators on the operation, response to, and maintenance of the technologies employed is also provided. The development of operations manuals and emergency response procedures and on-site course instruction of building personnel, are offered as needed.



## Operation and Maintenance

Many of the technologies employed for CBR building protection require frequent operational checks, replacement and maintenance. For each technology employed, the logistical support requirements to sustain operation and the schedules required for maintenance are identified and provided.

For further information about CBIAC Building Protection Services, email: [cbiac-tat@battelle.org](mailto:cbiac-tat@battelle.org)



## **BACWORTH Encyclopedia Version 6.2**

*(Replaces HB-00-01 and HBK-03-02)*

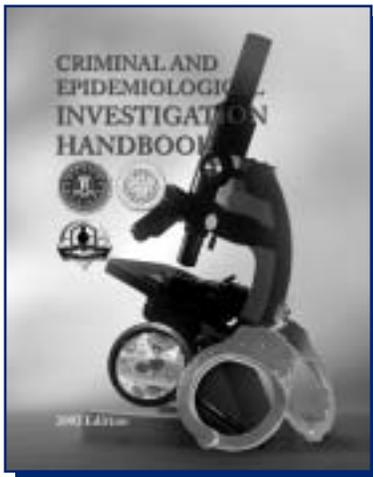
**Distribution Limitation:** *U.S. Federal Government Agencies Only;  
Export Controlled; For Official Use Only*

**HB-03-02**

**April 2003**

**Price:** \$175.00

The Biological and Chemical Warfare Online Repository and Technical Holdings (BACWORTH) Encyclopedia Version 6.2 contains detailed data on 85 CB agents, toxins, and riot control agents. Entries include both at-a-glance summaries and detailed description levels. There are also 13 overview functional chapters addressing critical CB defense topics in a non-agent specific format. The Encyclopedia cites more than 1,500 references. Each Agent entry covers 10 key topics.



## **Criminal and Epidemiological Investigation Handbook**

**Distribution Limitation:** *Unlimited; Unclassified*

**SOAR-03-08**

**March 2003**

**Price:** \$10.00

This publication provides an introduction to epidemiological and criminal investigations of biological incidents so public health and law enforcement personnel have a better understanding of each other's information requirements and investigative procedures. It identifies potential conflicts law enforcement and public health personnel will encounter during their respective biological incident investigations and provides potential solutions that can be adapted to meet the needs of various jurisdictions and agencies. It also enhances the appreciation and understanding of law enforcement and public health for each other's discipline.

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